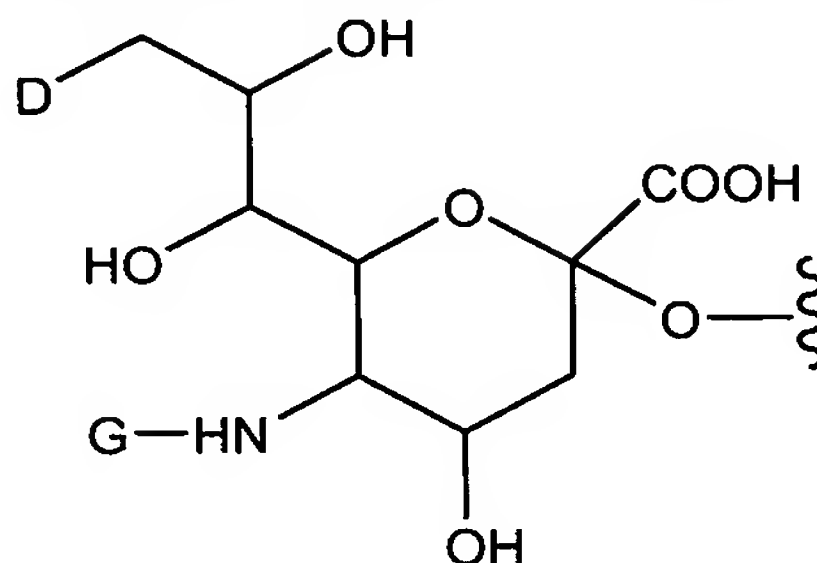


WHAT IS CLAIMED IS:

- 1 **1.** A Factor IX peptide comprising at least one moiety having the formula:



2

3 wherein

4 D is a member selected from -OH and R¹-L-HN-;

5 G is a member selected from R¹-L- and -C(O)(C₁-C₆)alkyl;

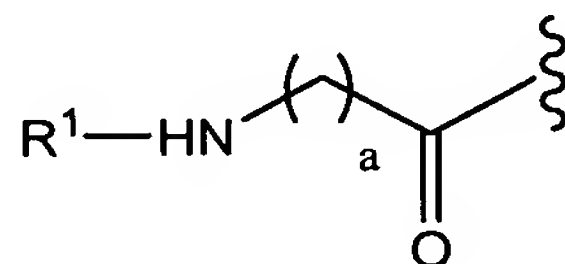
6 R¹ is a moiety comprising a member selected a straight-chain or branched
7 poly(ethylene glycol) residue; and

8 L is a linker which is a member selected from a bond, substituted or unsubstituted
9 alkyl and substituted or unsubstituted heteroalkyl,

10 such that when D is OH, G is R¹-L-, and when G is -C(O)(C₁-C₆)alkyl, D is

11 R¹-L-NH-.

- 1 **2.** The Factor IX peptide according to claim 1, wherein L-R¹ has the formula:

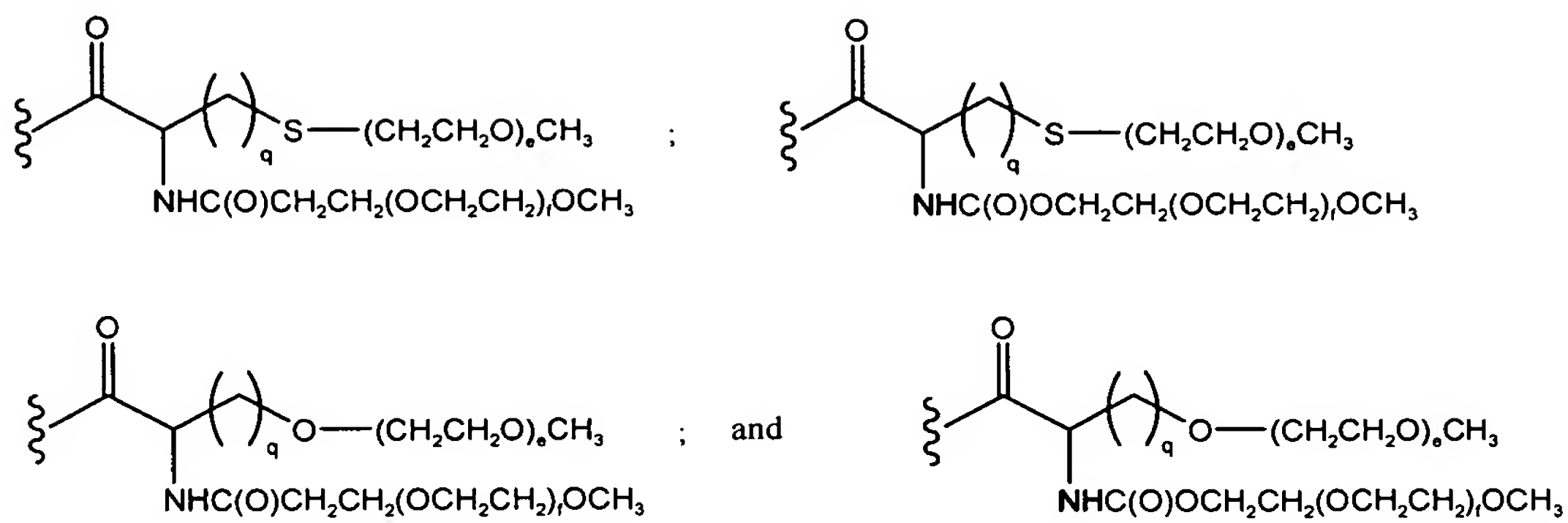


2

3 wherein

4 a is an integer from 0 to 20.

- 1 **3.** The Factor IX peptide according to claim 1, wherein R¹ has a structure that is a
2 member selected from:



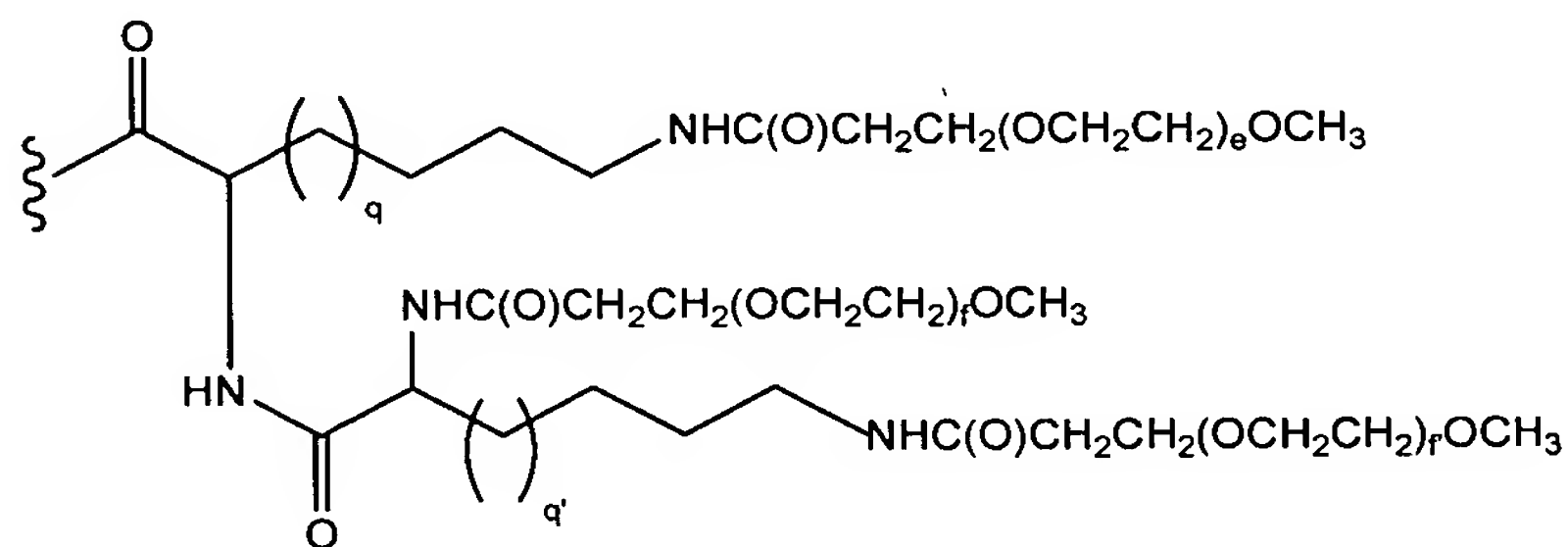
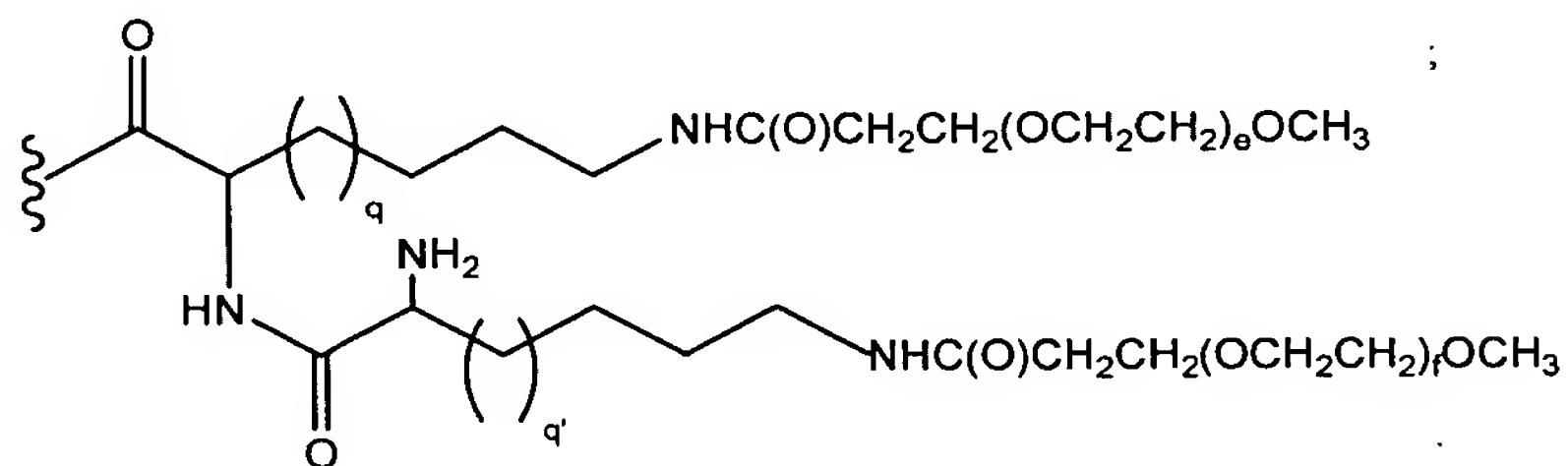
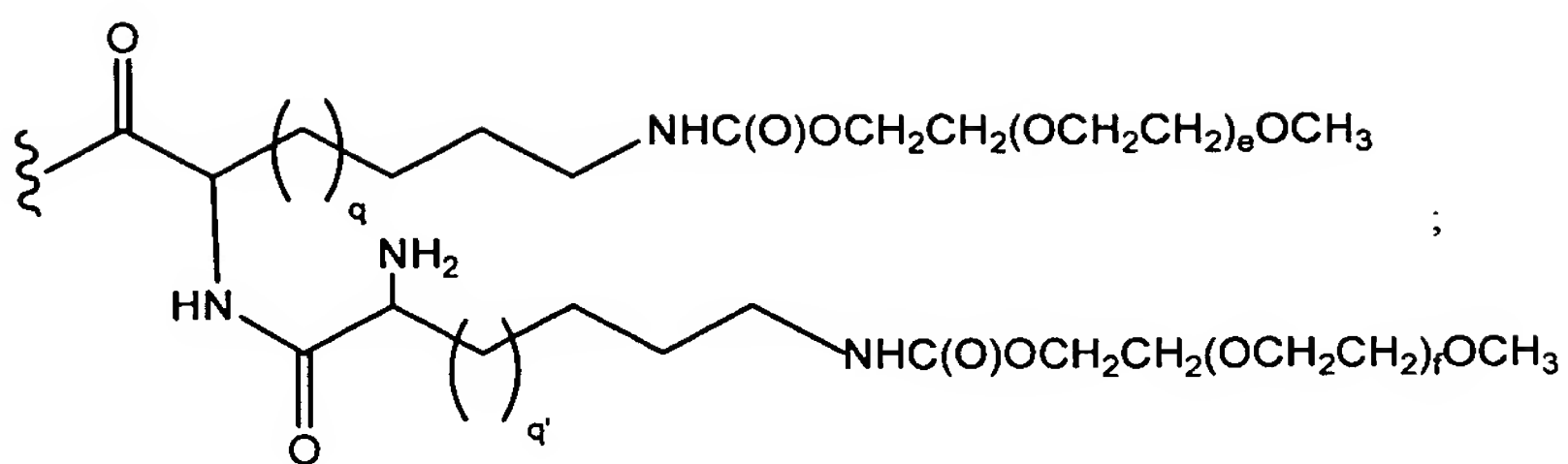
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4 wherein

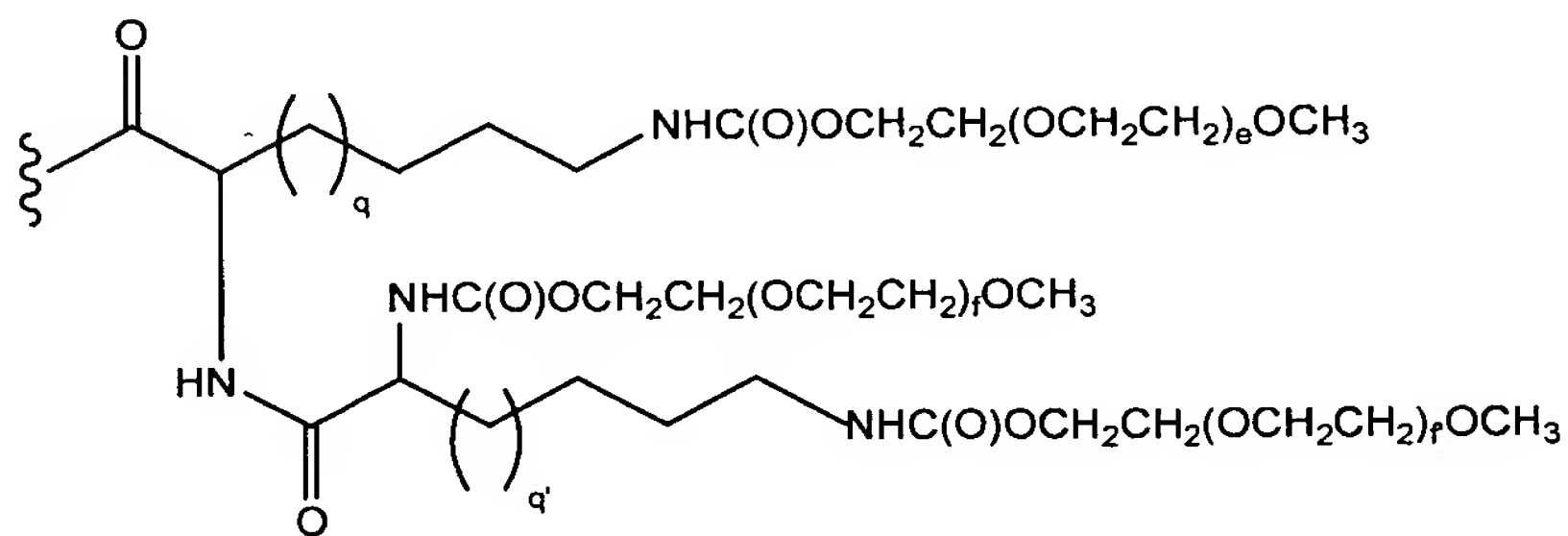
5 e and f are integers independently selected from 1 to 2500; and

6 q is an integer from 0 to 20.

1 4. The Factor IX peptide according to claim 1, wherein R¹ has a structure that is a
2 member selected from:



and



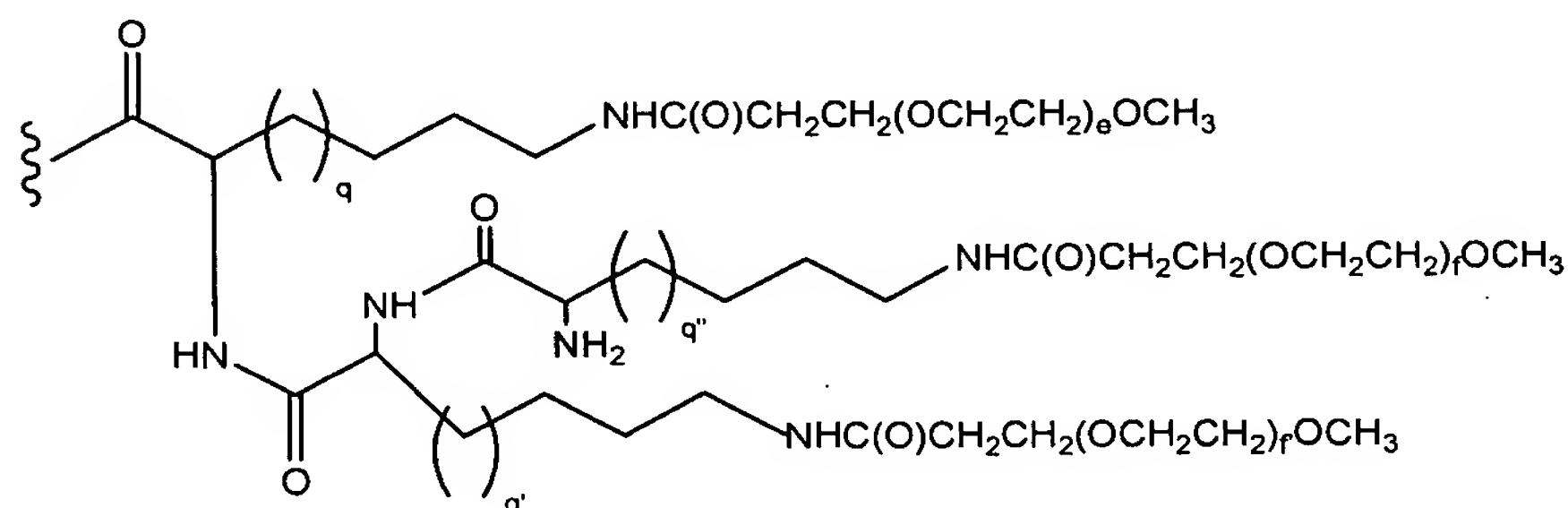
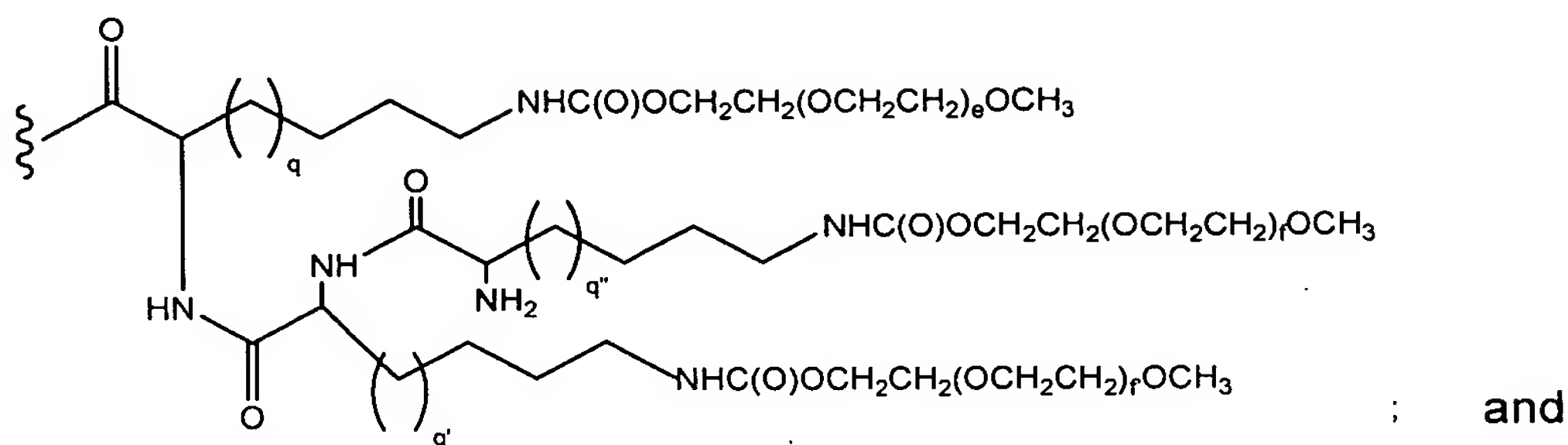
3

4 wherein

5 e, f and f' are integers independently selected from 1 to 2500; and

6 q and q' are integers independently selected from 1 to 20.

5. The Factor IX peptide according to claim 1, wherein R¹ has a structure that is a member selected from:

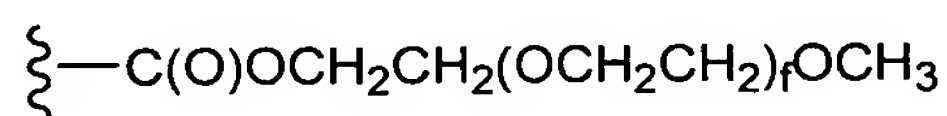


wherein

e, f and f' are integers independently selected from 1 to 2500; and

q, q' and q'' are integers independently selected from 1 to 20.

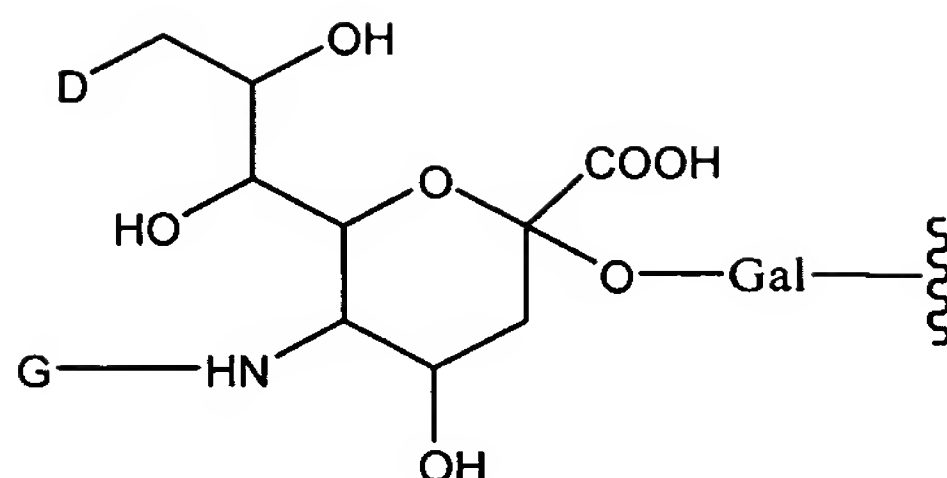
6. The Factor IX peptide according to claim 1 wherein R¹ has a structure that is a member selected from:



wherein

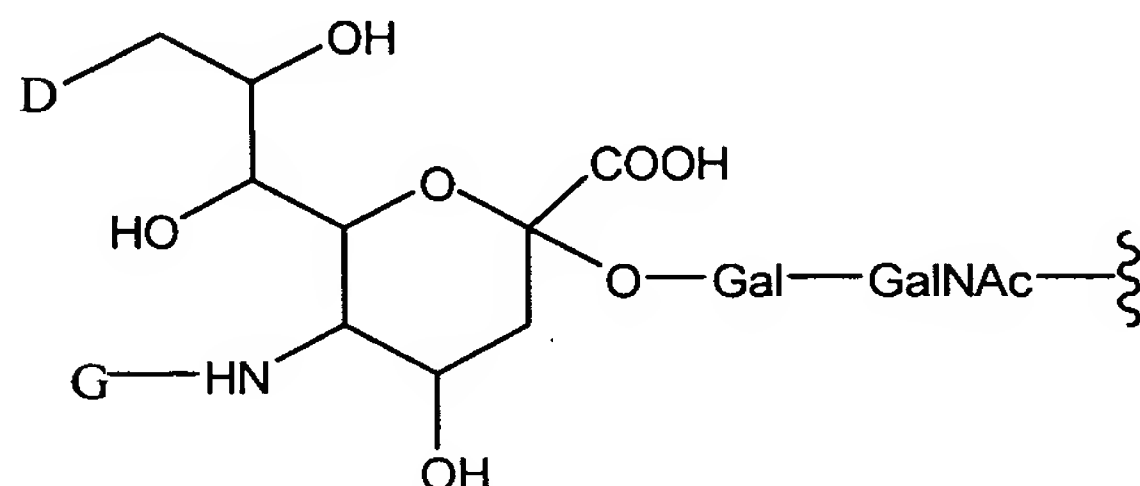
e and f are integers independently selected from 1 to 2500.

7. The Factor IX peptide according to claim 1, wherein said moiety has the formula:



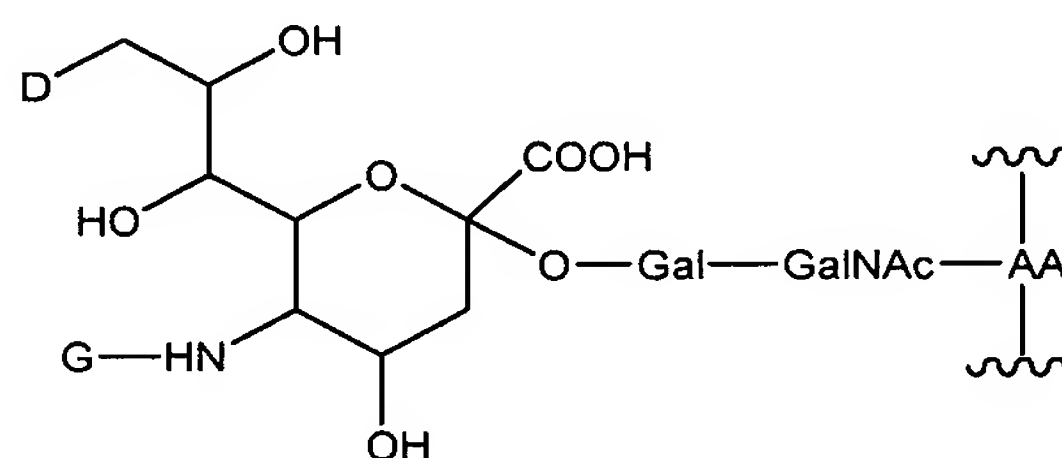
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1 **8.** The Factor IX peptide according to claim 1, wherein said moiety has the formula:



2

1 **9.** The Factor IX peptide according to claim 1, wherein said moiety has the formula:



2

3 wherein

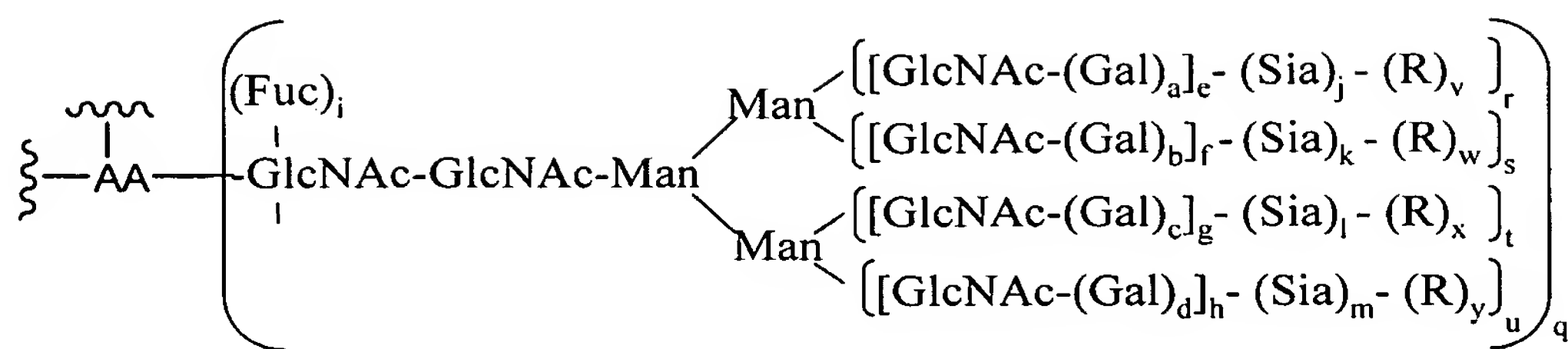
4 AA is an amino acid residue of said peptide.

1 **10.** The Factor IX peptide according to claim 9, wherein said amino acid residue is a
2 member selected from serine or threonine.

1 **11.** The Factor IX peptide according to claim 1, wherein said peptide has the amino acid
2 sequence of SEQ. ID. NO:1.

1 **12.** The Factor IX peptide according to claim 11, wherein said amino acid residue is
2 serine at position 61 of SEQ. ID. NO:1.

1 **13.** The Factor IX peptide according to claim 1, wherein said moiety has the formula:



wherein

a, b, c, d, i, r, s, t, and u are integers independently selected from 0 and 1;

q is 1;

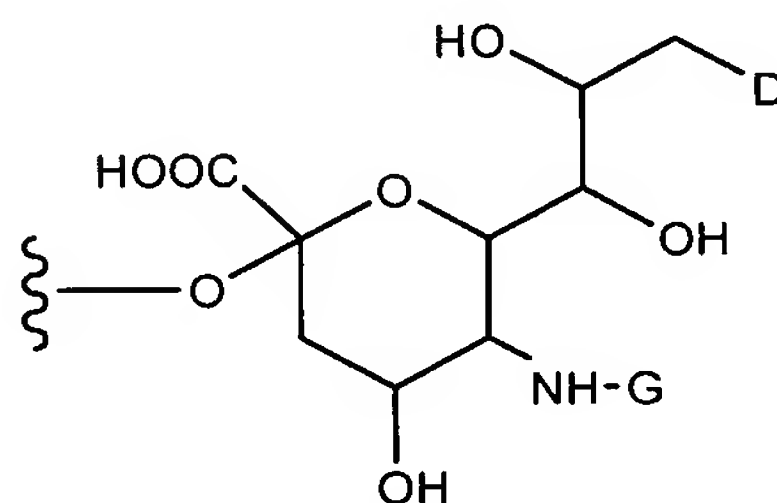
e, f, g, and h are members independently selected from the integers from 0 to 6;

j, k, l, and m are members independently selected from the integers from 0 and 100;

v, w, x, and y are independently selected from 0 and 1, and least one of v, w, x and y is 1;

AA is an amino acid residue of said Factor IX peptide;

Sia-(R) has the formula:



wherein

D is a member selected from -OH and $\text{R}^1\text{-L-NH-}$;

G is a member selected from $\text{R}^1\text{-L-}$ and $-\text{C}(\text{O})(\text{C}_1\text{-C}_6)\text{alkyl}$;

R^1 is a moiety comprising a member selected a straight-chain or branched poly(ethylene glycol) residue; and

L is a linker which is a member selected from a bond, substituted or unsubstituted alkyl and substituted or unsubstituted heteroalkyl, such that when D is OH, G is $\text{R}^1\text{-L-}$, and when G is $-\text{C}(\text{O})(\text{C}_1\text{-C}_6)\text{alkyl}$, D is $\text{R}^1\text{-L-NH-}$.

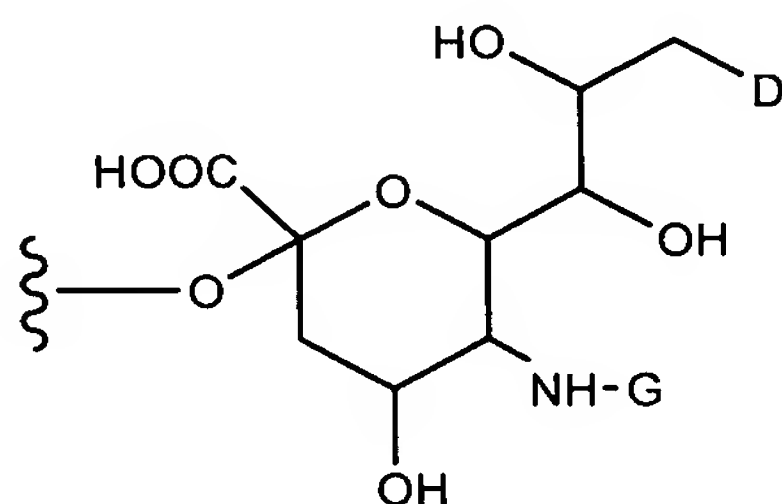
1 **14.** The Factor IX peptide according to claim 7, wherein said glycosyl residue is attached
2 to a member selected from Asn 157, Asn 167 and combinations thereof.

1 **15.** A pharmaceutical formulation comprising the Factor IX according to claim 1 and a
2 pharmaceutically acceptable carrier.

1 **16.** A method of stimulating blood coagulation in a mammal, said method comprising
2 administering to said mammal said Factor IX peptide according to claim 1.

1 **17.** A method of treating hemophilia in a subject, said method comprising administering
2 to said subject said Factor IX peptide according to claim 1.

1 **18.** A method of making a Factor IX peptide conjugate comprising the moiety:



3 wherein

4 D is a member selected from -OH and R^1 -L-HN-;

5 G is a member selected from R^1 -L- and $-C(O)(C_1-C_6)$ alkyl;

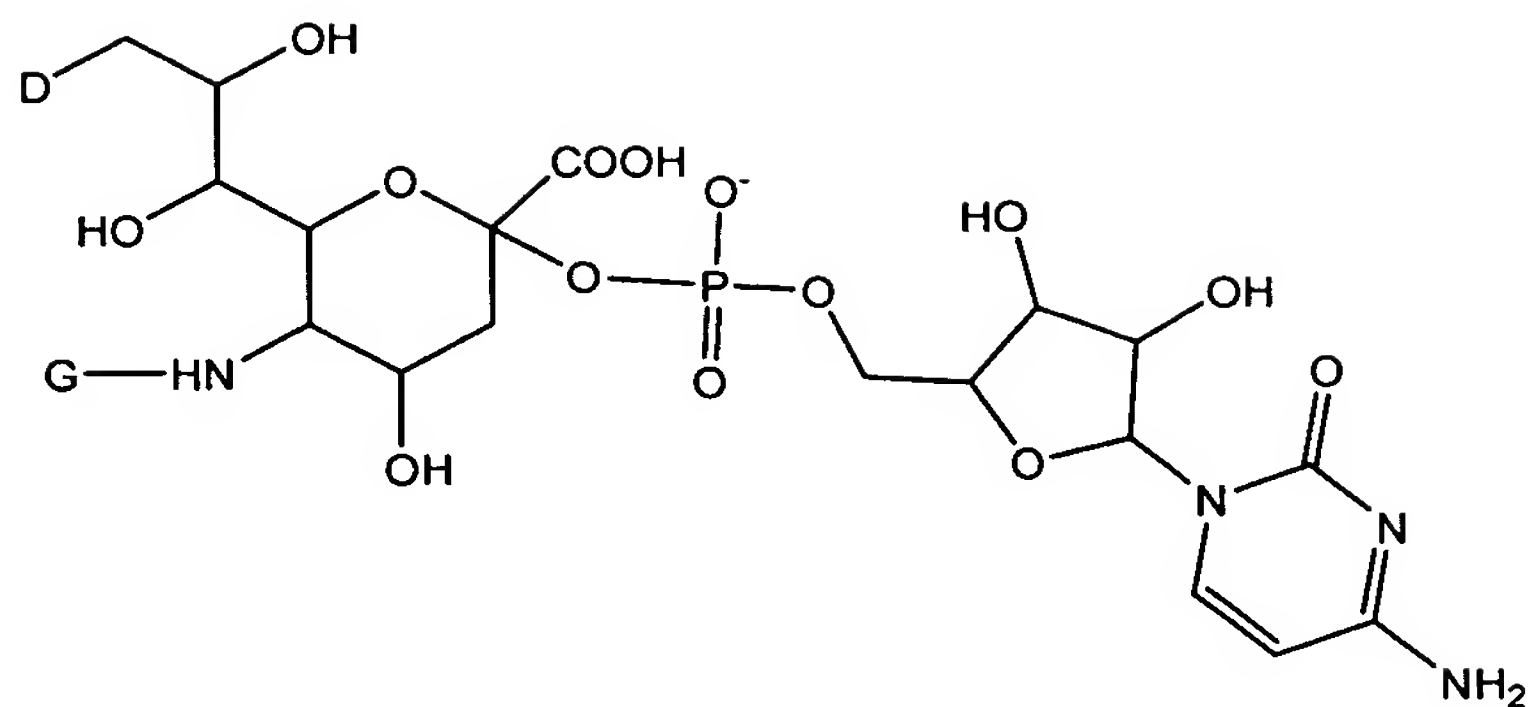
6 R^1 is a moiety comprising a member selected a straight-chain or branched
7 poly(ethylene glycol) residue; and

8 L is a linker which is a member selected from a bond, substituted or unsubstituted
9 alkyl and substituted or unsubstituted heteroalkyl,

10 such that when D is OH, G is R^1 -L-, and when G is $-C(O)(C_1-C_6)$ alkyl, D is
11 R^1 -L-NH-,

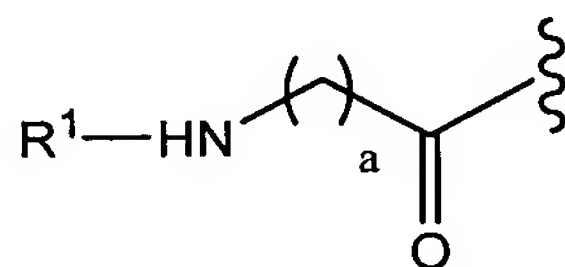
12 said method comprising:

13 (a) contacting a substrate Factor IX peptide with a PEG-sialic acid donor moiety
14 having the formula:



and an enzyme that transfers said PEG-sialic acid onto an amino acid or glycosyl residue of said Factor IX peptide, under conditions appropriate for the transfer.

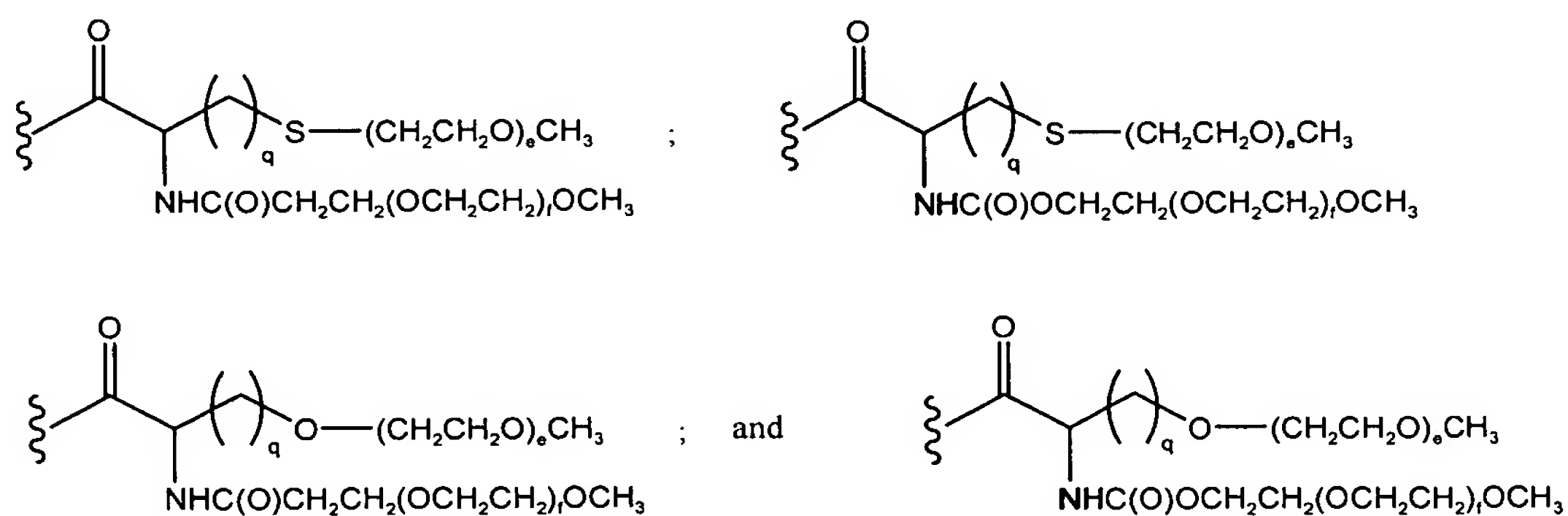
19. The method according to claim **18**, wherein L-R¹ has the formula:



wherein

a is an integer from 0 to 20.

20. The method according to claim **18**, wherein R¹ has a structure that is a member selected from:

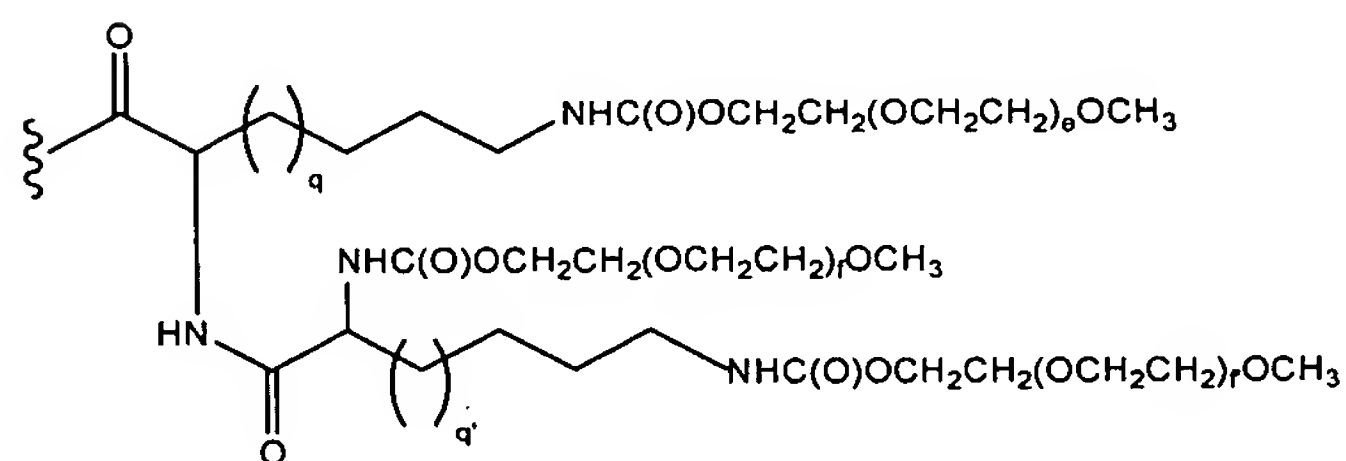
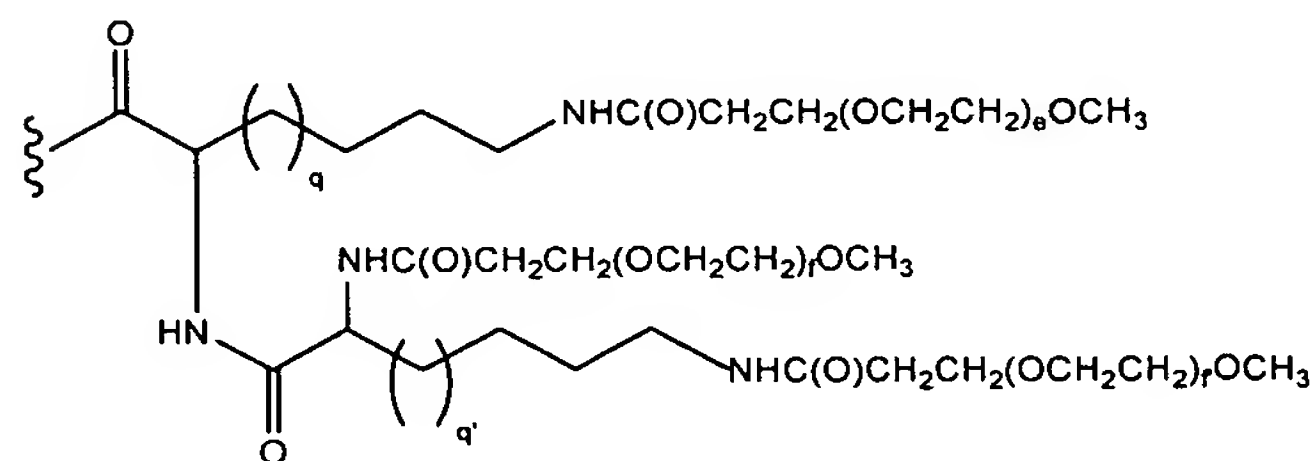
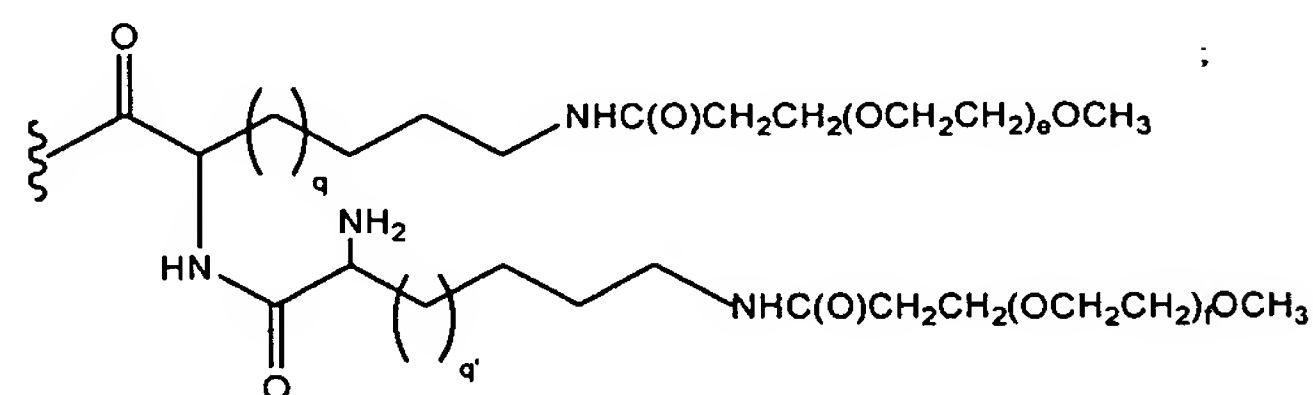
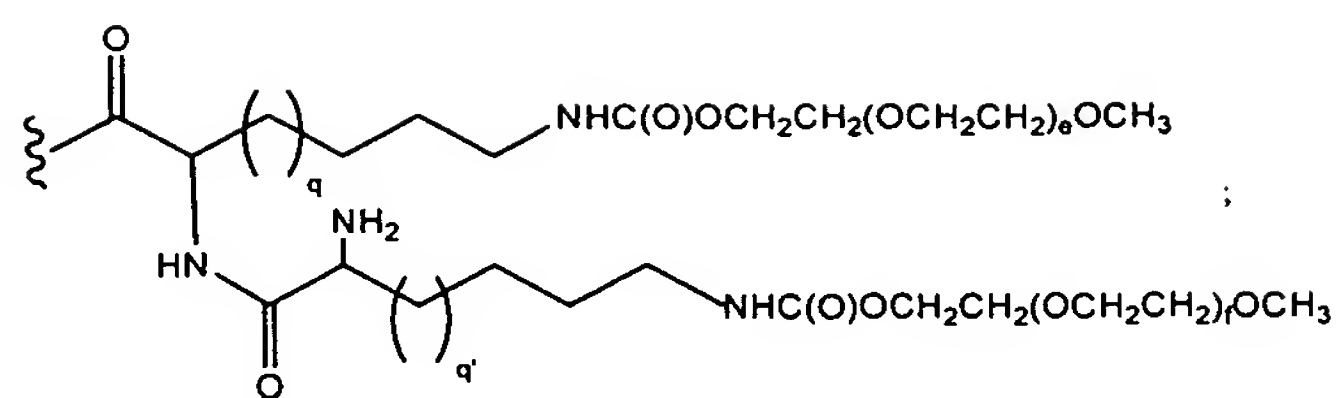


wherein

e and f are integers independently selected from 1 to 2500; and

q is an integer from 0 to 20.

21. The method according to claim **18**, wherein R¹ has a structure that is a member selected from:



and

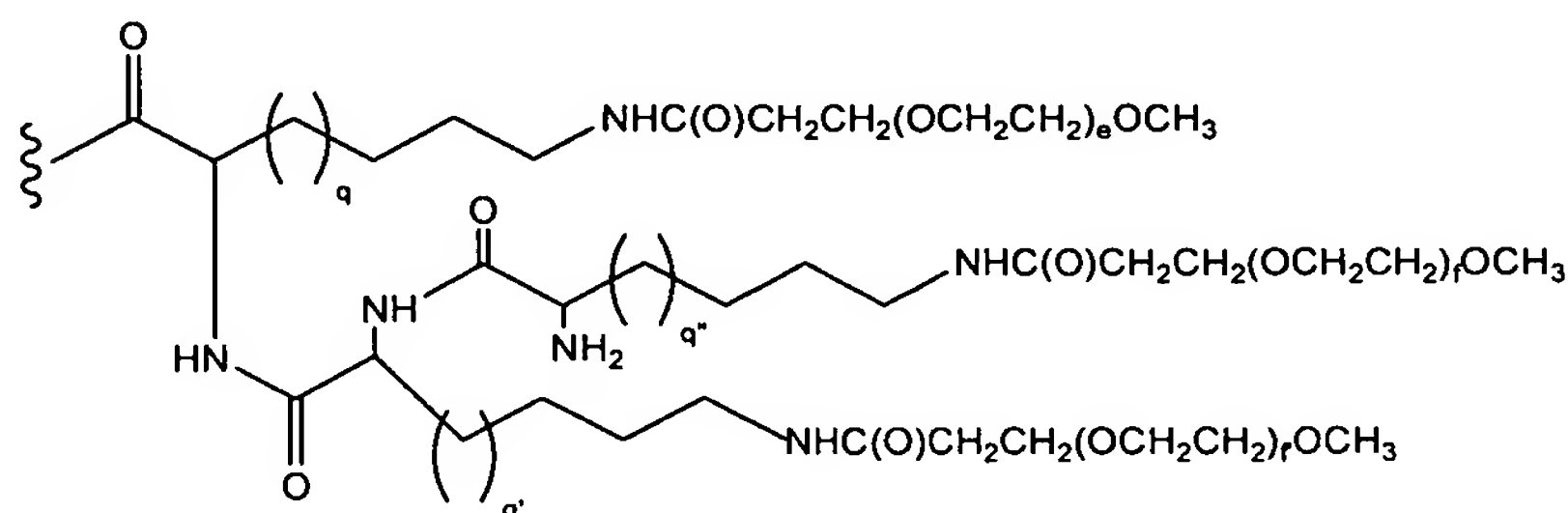
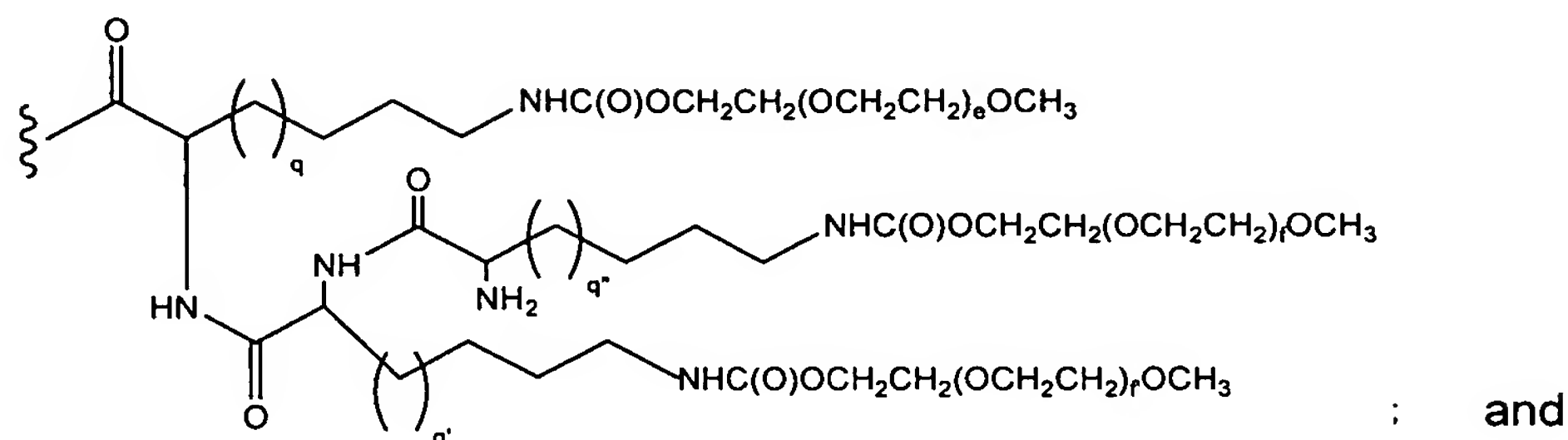
3

4 wherein

5 e, f and f' are integers independently selected from 1 to 2500; and

6 q and q' are integers independently selected from 1 to 20.

1 **22.** The method according to claim **18**, wherein R^1 has a structure that is a member
 2 selected from:



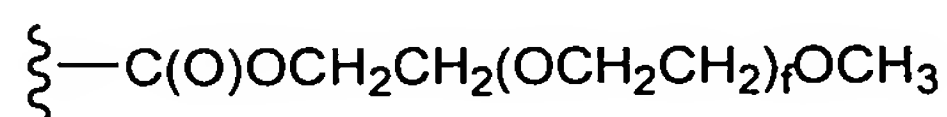
3

4 wherein

5 e, f and f' are integers independently selected from 1 to 2500; and

6 q, q' and q'' are integers independently selected from 1 to 20.

1 **23.** The method according to claim **18** wherein R^1 has a structure that is a member
 2 selected from:

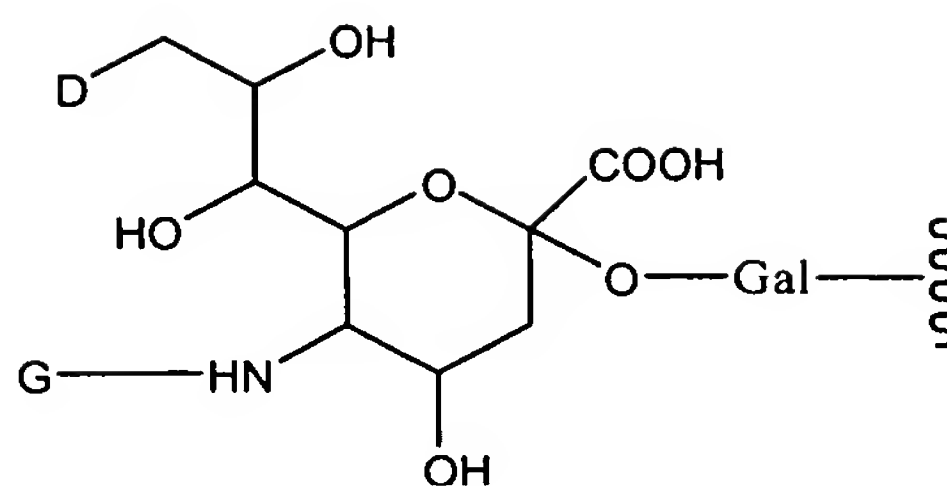


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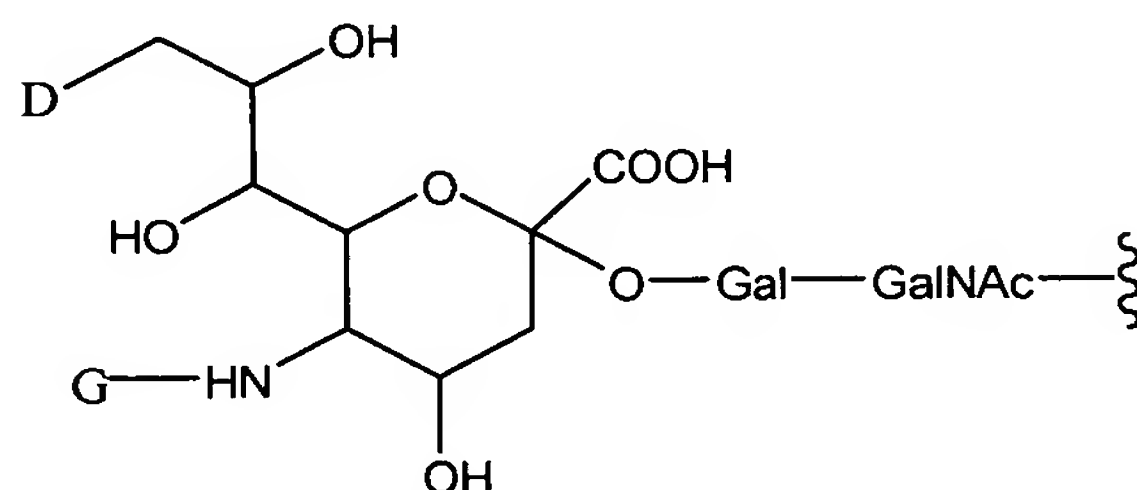
4 wherein

5 e and f are integers independently selected from 1 to 2500.

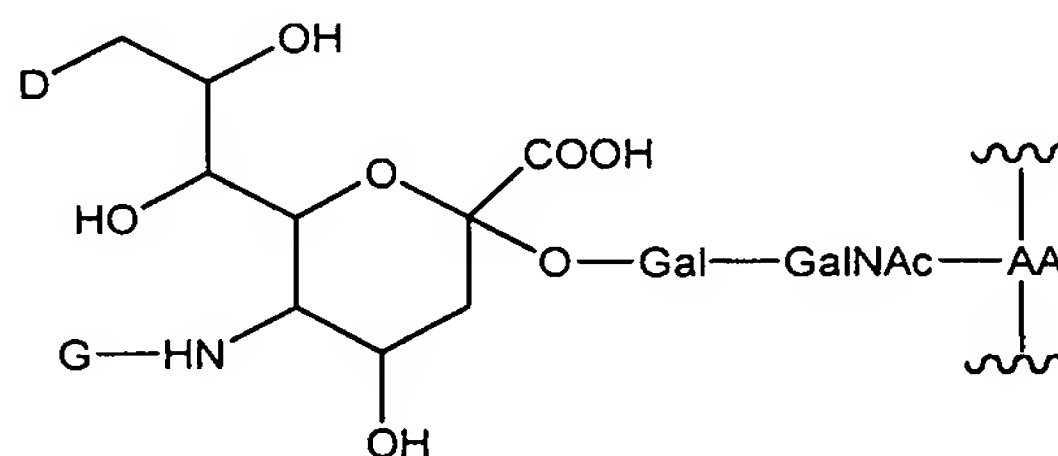
1 **24.** The method according to claim **18**, wherein said Factor IX peptide conjugate
 2 comprises a moiety having the formula:



25. The method according to claim **18**, wherein said Factor IX peptide conjugate comprises a moiety having the formula:



26. The method according to claim **18**, wherein said factor IX peptide conjugate comprises a moiety having the formula:



wherein

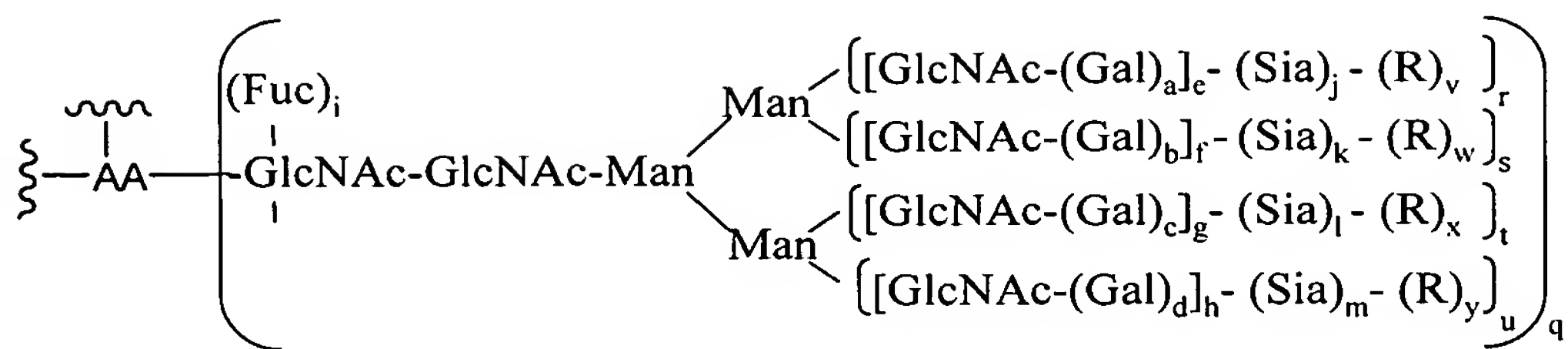
AA is an amino acid residue of said Factor IX peptide.

27. The method according to claim **26**, wherein said amino acid residue is a member selected from serine or threonine.

28. The method according to claim **18**, wherein said factor IX substrate peptide has the amino acid sequence of SEQ. ID. NO:1.

29. The Factor IX peptide according to claim **28**, wherein said amino acid residue is serine at position 61 of SEQ. ID. NO:1.

30. The method according to claim **18**, wherein said Factor IX conjugate comprises a glycosyl residue having the formula:



wherein

a, b, c, d, i, r, s, t, and u are integers independently selected from 0 and 1;

q is 1;

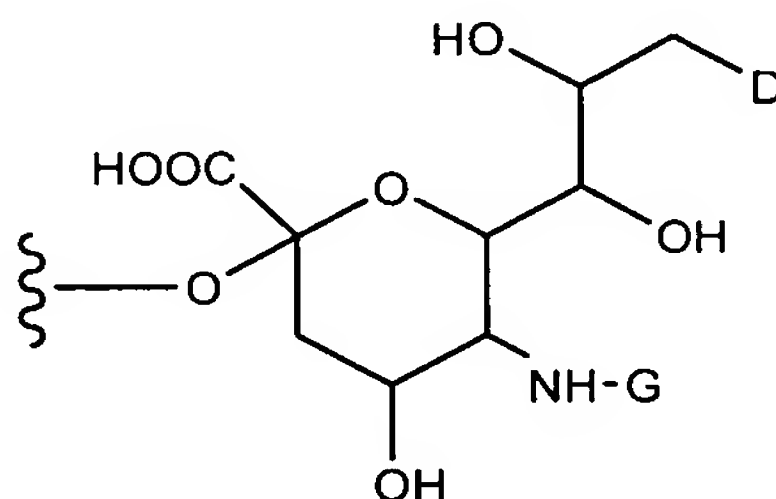
e, f, g, and h are members independently selected from the integers from 0 to 6;

j, k, l, and m are members independently selected from the integers from 0 and 100;

v, w, x, and y are independently selected from 0 and 1, and at least one of v, w, x, and y is 1;

AA is an amino acid residue of said Factor IX peptide;

Sia-(R) has the formula:



wherein

D is a member selected from -OH and $\text{R}^1\text{-L-HN-}$;

G is a member selected from $\text{R}^1\text{-L-}$ and $-\text{C(O)}(\text{C}_1\text{-C}_6)\text{alkyl}$;

R^1 is a moiety comprising a member selected a straight-chain or branched poly(ethylene glycol) residue; and

L is a linker which is a member selected from a bond, substituted or unsubstituted alkyl and substituted or unsubstituted heteroalkyl, such that when D is OH, G is $\text{R}^1\text{-L-}$, and when G is $-\text{C(O)}(\text{C}_1\text{-C}_6)\text{alkyl}$, D is $\text{R}^1\text{-L-NH-}$.

1 **31.** The method according to claim **30**, wherein said glycosyl residue is attached to a
2 member selected from Asn 157, Asn 167 and combinations thereof.

1 **32.** The method of claim **18**, further comprising, prior to step (a):

2 (b) expressing said substrate Factor IX peptide in a suitable host cell.

1 **33.** The method of claim **32**, wherein said host is selected from an insect cell and a
2 mammalian cell.